The RUBBER AGE

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Published Twice-a-Month by

The PALMERTON PUBLISHING CO., Inc.

(Publication Office—1-3 Peace Street, New Brunswick, N. J.)

Editorial Office: 250 West 57th Street, New York City

Entered as Second Class Matter, August 24, 1927, at the Post Office at New Brunswick, N. J., under Act of March 3, 1879.

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THE RUBBER AGE is indexed in *Industrial Arts Index*

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VOL. 31, NO. 12 SEPTEMBER 25, 1932

LATE NEWS of the Industry

Ceremonies Mark the Building of Goodyear's 200,000,000th Tire

Occasion is Celebrated in All Goodyear Plants Throughout the World—Tire to Go Into Museum—Prices of Tires Rise During Fortnight—Rubber Exchange Nominates Officers for Ensuing Year

GOODYEAR Tire and Rubber Company's 200,000,000th tire, hot from the pit, was presented to President P. W. Litchfield in the morning of September 12, with elaborate ceremonies, by pit men Pete Conner and Marshall Little, after about a score of officials and members of the factory's "old guard" had watched its construction.

Promptly at 9 a. m. whistles of the Goodyear factory in Akron and of those scattered throughout the world blew blasts announcing the 200,000,000th Goodyear tire was about to be built.

While the whistle blew the group of Goodyear men gathered in the lobby before Litchfield's office went to the factory room in which tires are built. There they watched Eldred Stanley build the tire.

Stanley, unflustered by the glare of the photographers' spotlights and the cranking of a movie camera, completed the task in a little more than 10 minutes. Without interference he would have been done in a little more than five.

In the group of spectators was E. D. Viers, supervisor in the truck tire department, who had a job similar to Stanley's more than 25 years ago when the first automobile tire was being built.

He recalled that in those days a builder, with crude tools and a wooden core, took more than an hour longer for his work.

Other members of the "old guard" who have been with Goodyear since before automobile tires were built there included A. B. Cunnington, now in charge of the main lobby, George Swartz, carpenter shop employe, Fred Colley, who has charge of employes' activities, and Ed Hippensteal, mill room worker.

As the mold was wrenched apart, Little removed the casing, and handed it, smoking hot, to President P. W. Litchfield, who added it to the Goodyear collection of historic tires.

Tire No. 200,000,000 will not go into service. Tires No. 200,000,001-2-3-4 are likely to go around the country for display purposes.

As the day's big job came out of the mold, whistles were blown at the two Akron Goodyear plants. They also were blown in Bowmanville and New Toronto, Canada; Gadsden, Alabama; Los Angeles, California; Sydney, Australia; Wolverhampton, England, and Buenos Aires, Argentina, where there also are Goodyear tire plants.

There were also celebrations at Goodyear rubber plantations, fabric mills, important sales centers, etc., all around the world.

Tire Prices Are Increased 11 to 15% After Mail Order Houses Advance Lists

A GENERAL increase of from 11 to 15 per cent in prices of automobile tires and of 15 per cent in prices of tubes, was announced September 12, by leading manufacturers and mail-order concerns. The advance follows an increase of more than 2½ cents a pound in the price of cotton and of more than 1½ cents a pound in the price of rubber during the last three months.

The tire manufacturers sought to increase prices by a similar amount last June, when new Federal taxes were imposed on tires and tubes. The attempt failed, however, when mail-order companies, which had accumulated large stocks before the tax went into effect, refused to advance prices.

The new prices will mean that the public, instead of the manufacturer, will absorb the Federal taxes, which amount to somewhat less than the proposed increase. If the higher quotations hold, the manufacturer also will have a slightly larger margin of profit than before the tax went into effect.

Although stocks of tires in the hands of retailers are still large, tire executives believe the higher quotations will meet with general support throughout the industry, owing to the cooperation of the mail-order firms. Prices of tires now are at the lowest levels ever recorded.

In addition to profiting through the higher prices on fin-

ished goods, the tire manufacturers now have a large appreciation in the value of their stocks of raw materials. Most of the manufacturers have a supply of rubber and cotton sufficient for six months' output. The value of this inventory has increased between 30 and 50 per cent in the last three months. This situation contrasts sharply with that of recent years, in which the manufacturers have been reporting large losses on their inventories of rubber, cotton, and on stocks of finished goods.

Six-Hour Day Urged on the Industry to Aid Unemployment

THE SIX-HOUR day for office workers in the rubber industry was advocated recently following declarations that the United States Chamber of Commerce special committee on the short week, headed by P. W. Litchfield, president of Goodyear, would recommend shortening the hours of "white collar" employes in the industry to make more jobs.

The committee's recommendation is to be made in a formal report to the Chamber within the next few days. The investigation has been finished, and recommendations agreed upon, it is reported.

It will suggest the extension of the six-hour day to include all business and industry. While reductions in individual income will result, there will be no reduction in the total amount of wages and salaries, it is said.

Mr. Litchfield says that the hours of factory labor will not be increased beyond an arbitrary limit of 40 a week while unemployment prevails. He advocates dividing the available work of the nation among the available workers, on whatever basis is necessary to re-employ the more than 6,000,000 idle Americans.

Tire Shipments and Production During June Drop Sharply From June Figures

SHIPMENTS of pneumatic casings for the month of July amounted to 2,404,095 casings, a decrease of 76.8 per cent under June this year, and were 56 per cent below July, 1931, according to statistics released by the Rubber Manufacturers Association, Inc.

The Association reported production of pneumatic casings for July to be 3,616,829 casings, a decrease of 35.9 per cent under June this year and 26.6 per cent below July, 1931. Pneumatic casings in the hands of manufacturers July 31st amounted to 6,202,856 units, an increase of 34.1 per cent above June 30th but were 37.5 per cent below July 31st, 1931.

The comparative figures are as follows:

Pneumatic Casings

	Shipments	*Production*	*Inventory*
July, 1932	2,404,095	3,616,829	6,202,856
June, 1932	10,366,640	5,643,329	4,625.021
July, 1931	5,461,908	4,926,484	9,919,456

Rubber Consumption Drops Sharply While Imports Show 10% Increase

CONSUMPTION of crude rubber by manufacturers in the United States for the month of August amounted to 22,372 long tons as compared with 28,272 long tons for July, 1932, and represents a decrease of 20.9 per cent according to statistics released by the Rubber Manufacturers Association.

Imports of crude rubber for the month of August were reported to be 34,219 long tons, an increase of 10.1 per cent above July, 1932, but was 10.8 per cent below August a year ago.

The Association estimates total domestic stocks of crude rubber on hand August 31, at 357,342 long tons, which compares with July 31 stocks of 345,927. August stocks show an increase of 3.3 per cent as compared with July of this year, and were 48.4 per cent above the stocks of August 31, 1931.

NEW YORK RUBBER GROUP, A. C. S., WILL MEET OCTOBER 5

ALTHOUGH full details of the next meeting of the New York Group, Rubber Division, A. C. S., are not available as we go to press, we are able to state that the meeting will be held on Wednesday evening, October 5, at the usual meeting place in the club rooms of the Building Trades Employers' Association, at 2 Park Avenue, New York City.

The program will probably consist of a paper on "Balloon Tires" by B. J. Lemon; a travelogue by E. T. Croasdale and an entertaining paper on "Freak Patents" by a speaker yet to be announced.

The meeting will be preceded by a dinner at 6:30 p. m. Tickets will be $2.00 each and all reservations should be sent as soon as possible to the secretary of the Group, Peter P. Pinto, at 250 West 57th Street, New York, N. Y.

Rubber Exchange Nominates List Of New Officers—Slaughter for Head

CHARLES SLAUGHTER, prominent commission and brokerage factor in commodities, recently was named to be president of the Rubber Exchange of New York to succeed John L. Julian, whose second term expires on October 20 next. Mr. Julian had succeeded Francis R. Henderson in that post, one of the original organizers of the exchange in 1926.

The nominating committee also renamed William A. Overton as vice-president and J. Chester Cuppia as treasurer, and designated the following new candidates for the board of governors: Robert L. Baird, associated with H. Hentz and Company; Otto Meyer of the Meyer and Brown Corporation, and Lawrence G. Odell of Odell and Sons.

The candidates for the board will succeed E. J. Wade, Fred Pusinelli and Frank D. Pressinger, who are retiring.

Charles Slaughter, nominee for president, was born in Lynchburg, Va., forty-five years ago and after leaving the University of Virginia came to New York in 1905 where he started his business career as a runner for Shearson, Hammill and Company. After serving a brief clerkship, Mr. Slaughter won promotion to the commodity department of that firm. From then on he widened his activities and influence in the commodity and trade field.

In the year 1914 Mr. Slaughter became connected with W. R. Craig and Company, a firm that has figured prominently in the cotton market, as office manager, and in 1917 was admitted as a member of the firm. In 1929 he and his associates organized the firm of Slaughter, Horne and Company, to carry on a merchandising and commission business in commodities, including crude rubber, coffee, sugar and other products.

Nelson S. Robinson, James R. Shannon and G. A. Sullivan were nominated for inspectors of election to serve in October, 1933.

(Other news of the industry will be found on Pages 482-486)

Solvent Naphtha Recovery *for the Rubber Industry*

By W. R. KNAPP*

IN TIMES of depression it is essential that all industries conserve their resources and perfect their processes. This necessity for conservation has brought to the rubber industry a method for the recovery of the solvent naphtha now lost to the atmosphere, resulting in a material saving in the production cost of their finished product.

The New York Testing Laboratories, in an economic study of the rubber industry, determined that with the recovery of the solvent naphtha now lost in the ventilating system and with the return of the recovered naphtha to the process an economic balance could be established invariably resulting in a reduction of the manufacturing cost, when the fixed charges on the capital investment in recovery apparatus did not exceed 12½ per cent of the annual expenditure for solvent. Such a low capital investment automatically eliminated from consideration any recovery by refrigeration, compression, or absorption in an oil circulation, or any combination of the above. The study also brought out that the apparatus must be simple in design, easy to operate, practically automatic in operation with a minimum of manual labor required. The only process that can meet the above requirements is an adsorption system.

The process as designed is based upon the selective affinity of activated carbon for oil vapors and at the same time takes advantage of the ease with which the fouled carbon can be reactivated for further use. When a current of air or other gas containing oil vapors is passed through a body of activated carbon, the oil content is removed from the gas stream by the activated carbon, allowing the true gas stripped of its vapor content to pass out unchanged. With enough volume of carbon, and sufficient time of contact, the entire vapor content of the gas stream can be recovered.

With the present type of ventilating systems where a high factor of safety from explosive mixtures is maintained, running as high as a factor of 5 or 6, an apparatus for a 100 per cent recovery is not economically feasible. Economically the study then resolves into whether it is advisable to reduce the explosive safety factor of the circulation system, or to lower the percentage recovery of the solvent naphtha.

The studies of the New York Testing Laboratories have proven that a fair economical balance can be established with a system capable of recovering 90 per cent of the vapor content of the circulation system and at the same time maintaining the high explosive safety factor of 5. In other words, in a system carrying one-tenth gallon of naphtha per thousand cubic feet of air circulated, ninety per cent of the naphtha can be economically recovered and returned to the system, requiring only ten per cent of fresh naphtha for makeup. Even with plants consuming small quantities of naphtha per day the annual return on the capital investment averages 50 to 75 per cent after deducting 15 per cent for fixed charges, that is, the investment is returned every sixteen months to two years.

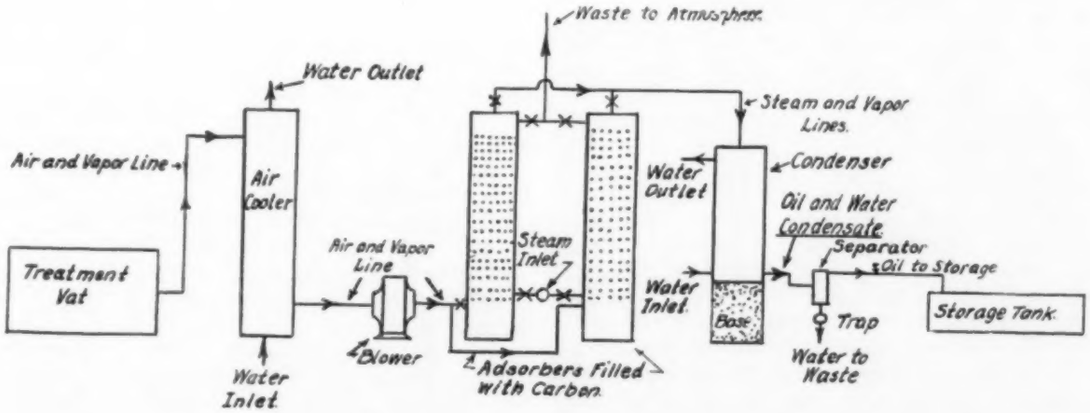
The new system as designed is not a radical departure from the present system, as there is no change in the vats or curing chambers but only an addition to the present discharge to the atmosphere, and as most systems have a fan capable of handling the required circulation with a differential of only a few inches of water, a new positive type blower or exhauster is added.

The naphtha recovery system as designed consists of:

1st—A positive type blower of a sufficient size to maintain the circulation system with a safety factor of 5, and an overall differential of 3 lbs. per sq. in. This ensures at all times a positive circulation on the system and reduces to a minimum the explosion hazard, and should result in a reduced fire insurance premium on the factory.

2nd—An air cooler, to ensure correct and uniform tem-

*Research Engineer for New York Testing Laboratories, 80 Washington Street, New York City.



FLOW SHEET OF NAPHTHA RECOVERY PROCESS

perature for the adsorption units. The air cooler has ¾" O.D. deoxidized copper seamless tubes with ⅜" fins spaced six per inch.

3rd—Adsorbers of sufficient size and number to handle the circulation requirements of the factory. The shell and heads are of ½" flanged steel designed for 150 lbs. pressure. The apparatus is complete with cast iron gratings to support the carbon bed in center of adsorber and with copper screens below and above the carbon bed cemented fast to the steel shell and with internal air distributing manifolds, necessary recording thermometers, pressure gauges, valves, etc. The carbon bed is of sufficient volume to permit the adsorber to remain on charge two hours.

4th—Tubular surface condenser, constructed of 14 gauge deoxidized copper, except tube sheets, which are of ⅜" copper plates. Tubes ¾" O.D. #14 gauge seamless copper tubes.

5th—Gravity decanter made of 3/16" tank steel, hot galvanized after fabrication. The decanter is furnished with a wire glass cover to permit observation of the oil flow.

6th—Control board, with recording thermometers connected with each adsorber, pressure gauges connected to each adsorber, two manometers to indicate the quantity of circulation flowing through the recovery system, and an indicating thermometer to the vapor line to regulate the time of steaming an adsorber.

From experience, the New York Testing Laboratories have found that "Just any" activated carbon will not meet the requirements for adsorption work, but that only a special grade of carbon is satisfactory. The carbon must be strong and dense enough to withstand all abrasion, not to deteriorate with use, and yet contain enough cell space to adsorb all the oil vapors from the gas stream within a given period of contact. This special product has been developed and is used in the apparatus.

Method of Operation

The method of operation is as follows: The air containing the naphtha vapors is passed through one of the adsorbers, the adsorber remaining on charge for about two hours, after which the gas stream is diverted to the second adsorber. The devaporized air from the adsorber is discharged to the atmosphere. This removal of the naphtha from the air eliminates one of the nuisance factors that has bothered a number of specialty manufacturers, especially those that are near a residential section, where neighbors have often complained of the gas odors from the plant.

The adsorber that has been cut out of the gas stream is saturated with naphtha and has to be revivified before it is ready for use again. This revivification is accomplished by expelling the naphtha by means of a current of steam and the final cooling of the adsorber to atmospheric temperature.

As soon as an adsorber is removed from the circulation system, it is immediately connected to the naphtha recovery system. All that is required to change from one system to the other is the closing of the inlet and outlet gas valves, and the opening of the valve in the line to the condenser. After the adsorber has been connected to the condensing system, steam is turned into the adsorber and the naphtha that has been adsorbed in the carbon is expelled and carried with the steam to the condenser, where the oil vapor and steam are condensed and discharged to the gravity separator. In the gravity separator the oil and water separate into two layers; the water, at the bottom, escaping through a special trap to waste, and the oil, at the top overflowing to a collector or circulation tank. In the collector or circulation tank additional naphtha of the correct gravity is blended with the recovered naphtha to meet the requirements of the process. The adsorber after cooling is now ready to be returned to the system for a fresh charge of naphtha vapor.

The steam required for the process can be either exhaust steam under two or three pounds pressure, or, if exhaust steam is not available, saturated live steam direct from the boilers.

All the operation labor required for the process is an operator to open and close the valves at the time of changing the adsorbers on the system, as the balance of the operation is automatic. These minor requirements can be added to the duties of some regular employee, and therefore no additional labor is required for the process. Outside of the exhauster there are no moving parts, therefore maintenance is negligible. From experience records of plants in this country and Europe, no replacement of the carbon is necessary, the reactivating of the carbon is positive and can be carried on indefinitely.

Therefore the only cost of the naphtha recovery is part of one man's time, plus the power, the steam, and water consumed together with the annual fixed charges on the investment.

The labor charge should not exceed 25 per cent of one man's time. The power consumption of the exhauster will not exceed 5/100 K.W. hour per thousand cubic feet of air circulated. To this should be credited the power consumption of the present fan.

The steam consumed will not exceed 24 pounds per gallon of naphtha circulated, or 27 lbs. of exhaust steam per gallon of naphtha recovered.

The fixed charges on plant investment including depreciation, interest, taxes, and insurance should not exceed 2 cents per gallon of naphtha recovered.

From the above data each operator can calculate the economics of the process as it affects his own operation.

Thiokol Products

FOR many years rubber has been considered an ideal gasketing material. Nothing makes as tight a joint as rubber. In addition to its sealing qualities it has stretch, compressibility, rebound and vibration dampening characteristics not found in any other material.

If rubber offered resistance to high temperatures and certain solvents, such as gasoline, kerosene, carbon-tetrachloride and similar liquids it would have universal application. Unfortunately, however, it lacks those qualities.

By combining rubber with asbestos it has been possible to develop products to operate satisfactorily against high temperature. Efforts to develop suitable rubber materials for use against solvents of the nature mentioned above, however, have not been successful. To offer reasonable resistance to gasoline and similar liquids, rubber must be vulcanized to a degree of hardness which destroys in a great measure the natural compression, stretch and rebound of that material.

That Thiokol offered the solution to the many problems of providing a packing for use against rubber solvents was evident to the Garlock Packing Company, Palmyra, New York, after extensive experiments. That company, therefore, has pioneered the development of many packing items using Thiokol instead of rubber. They are now marketing to the trade a number of new types of rod packings, diaphragms, discs and gaskets made from various Thiokol compounds.

Thiokol valve discs for use in place of rubber have proved satisfactory in service against rubber solvents. These discs are particularly suitable for service on gasoline filler hose, tank wagon valves and any other pipe line valves handling similar liquids.

Present FINANCIAL POSITION *of the* RUBBER INDUSTRY

Continued Losses by Leading Companies Are Causing Concern—Deficits Not Due So Much to Depression as to Severe Competition and Unwarranted Trade Practices—Earning Power of Companies Compared

SOUNDER operating and trade conditions within the rubber industry are looked for as a result of the economies inaugurated and the readjustments necessitated by the depression. The continued decline in earning power cannot go on and even with a return to prosperity, a change in the financing and merchandising methods of the industry is inevitable. It is to be granted that during this period of economic stress, large profits are not to be expected, but when year after year, the rubber companies show no improvement and in many cases greater losses, changes should come.

Aside from the effects of the depression, a large part of the profit decline among the companies in the industry has been directly due to severe competition, sharp price cutting and unwarranted trade practices within the industry.

As Dow, Jones & Co., puts it, "Increased depression in the earning power of the rubber and tire industry is pressing the need for a more cooperative basis for operations in this field. Inventory losses and smaller sales of tires have not alone caused its unfavorable showing.

Profit Position of Tire Industry

"In the first half of 1932, unit sales of tires were about equal to last year and only 6% under 1930. However, earnings results were materially lower than in 1931. Since the start of the second half, the tire profit position has been still further impaired, at least temporarily, by the failure of efforts to increase prices to cover the federal excise tax and leave a small net gain for the manufacturers.

"A large potential replacement demand for tires, the fact that the worst of the industry's inventory losses now seem out of the way, and the substantial cuts in operating and overhead expenses indicate large profit possibilities for the tire companies if necessary trade corrections are made."

The recent survey of the industry's financial position by Dow, Jones & Co., as abstracted below, presents several interesting angles.

In the half-year ended June 30, despite the general depression and the sharp decline in original equipment sales, unit shipments of tires were approximately equal to the like period of 1931 and were only 6% below the first half of 1930. Yet Goodyear, normally the largest profit maker in the field, reported earnings of only $50,509 for this year's period, representing a small fraction of its preferred dividend requirements, compared with net profits of $4,221,770 in the first half of 1931.

B. F. Goodrich incurred a net loss of $710,000 for the six months against a net loss of $288,000 last year, while United States Rubber reported a net loss of $5,028,399 against $4,660,202 in 1931. Firestone, reporting for the six months ended April 30, earned $1,639,739 against $2,908,553 in 1931, with no inventory adjustments reflected in either of its reports.

While inventory losses or reserves for such losses contributed to the poor showing of the first three companies during the half-year, results before these charges were nevertheless highly unfavorable in relation to the large investments involved.

Since the end of the first half, the profit position of the tire industry has been still more deflated due to the failure, for the time being at least, of efforts to add the federal excise tax, averaging about 11% on tires, to retail prices. This development has, in effect, represented a price cut of this extent and its influence on earning power, if the manufacturers should continue to absorb the tax without at least a corresponding increase in retail prices, is graphically indicated by the slim returns for the first six months before the tax went into effect.

The drop in the earning power of the four largest tire companies during the depression are shown in the following table. While the reports of the respective companies are not strictly comparable due to variations in accounting methods, the figures indicate the extent to which earnings have been impaired (last three figures omitted):

	1st half 1932	1st half 1931	year 1931	year 1930
†Firestone	$1,639	$2,908	$6,028	$1,541
Goodrich	*710	*288	*8,806	*8,374
Goodyear	50	4,221	1,328	9,912
U. S. Rubber	*5,028	*4,660	*9,473	*18,063

*Net loss. †Six months ended April 30 and years ended October 30.

The unfavorable results from operations during the last three years have naturally shown their influence also on the liquid assets of the companies through losses, dividends paid out of surplus, and inventory write-downs. Combined net current assets of the four largest companies have declined more than 25% since 1929.

Maturing Financial Obligations

However, the industry's current financial status is undoubtedly sufficient, in general, to finance larger operations. Inventories have been radically reduced in value while the low price of crude rubber has permitted the accumulation of large supplies of this commodity at a low average cost which would prove of great profit benefit in the event of any sustained improvement in rubber market prices. In addition, the industry has preserved a satisfactory cash position.

Near term maturities of rubber company funded obligations include $13,248,000 in U. S. Rubber notes in 1933, and $8,589,000 in obligations of Hood Rubber Company, in 1936. Aside from these maturities and a $2,000,000 annual maturity of U. S. Rubber serial notes, there are no rubber obligations falling due before 1940.

The following table compares the current financial status of the four leaders with their 1929 position (last three

figures omitted):

	Working capital		Cash assets		Bonds and pfd.	
	1932	1929	1932	1929	1932	1929
Firestone	*$51,544	$79,918	*$11,776	$30,039	*$73,601	$82,717
Goodrich	58,111	59,284	14,567	10,500	82,818	66,444
Goodyear	92,124	115,913	41,797	41,626	136,700	147,327
U. S. R.	†37,061	x79,048	11,608	16,799	y134,275	y146,345

*As of October 31, 1931, the latest available balance sheet. †Current liabilities include $13,248,000 funded debt maturing within one year. xCurrent liabilities include $20,336,000 funded debt maturing within one year. yIncludes $65,109,100 in non-cumulative preferred stock.

An interesting table showing the market recovery in face value of various stock issues of leading rubber companies on the New York Stock Exchange, as of August 31, 1932, compiled by the *New York Times*, is reprinted below, by way of showing the confidence which the buying public or at least, the speculative market, still has in the rubber industry, at the slightest upturn:

Rubber Shares

	Aug. 29, 1932. Shares Listed	Closing. July, 1932.	Closing. Aug., 1932.	Net Ch'ge.	Increase.	Decrease.
Fisk Rubber	1,779,177	¼	⅝	+ ⅜	$667,191	.....
Goodrich (B. F.) Co.	1,167,142	5	10⅜	+ 5⅜	6,273,388	.....
Goodyear Tire & Rubber Co.	1,371,443	12¼	28	+15¾	21,600,227	.....
Kelly-Springfield Tire Co.	1,063,840	1⅛	2⅛	+ 1	1,063,840	.....
Norwalk Tire & Rubber Co.	202,730	1	2⅜	+ 1⅜	278,754	.....
U. S. Rub. Co.	1,545,959	3⅞	9⅜	+ 5½	8,502,774	.....
Total					$38,386,174	.....

The following table compares the market prices of the principal securities of the leading tire companies with the highs reached on the recent advance, with the previous highs for 1932, and with the lows for 1932:

	Current	1932 *High*	*Previous* 1932 *High*	1932 *Low*
Firestone	14⅞	18⅞	15⅛	10½
Goodrich	9⅛	12⅜	5⅝	2¼
Goodyear	21⅜	29¾	18¾	5½
U. S. Rubber	7¼	10¼	5⅜	1¼
Firestone pfd.	64	68	59½	45
Goodrich pfd.	28	33¼	17	7
Goodyear pfd.	55½	69½	61	19¾
U. S. Rubber pfd.	14½	20¾	11½	3⅛
Goodrich 6s	57½	62	46¾	34¼
Goodrich 6½s	85	89½	80	60
Goodyear 5s	84	88	82¼	61½
U. S. Rubber 5s	57¾	62½	59½	28

Russian Synthetic Rubber

DISCUSSING, in its issue of August 27, the project of the Soviet Government for the manufacture of synthetic rubber on a large scale, *Die Chemische Industrie* points out that before the war Russia was the world's largest market for rubber footwear. In 1931 the value of Russian rubber manufactures was 458,000,000 roubles, whilst during the current year it is anticipated that the value of the output will have risen to 631,000,000 roubles.

At present the industry is entirely dependent upon imported raw rubber. Attempts have been made by the Soviet authorities to establish rubber plantations in various parts of European and Asiatic-Russia, but these attempts have not proved at all successful. Last year the amount of raw rubber utilized in Russia was 26,000 tons. For 1933 it is expected that consumption will amount to 75,000 tons, but in this last-mentioned year, if the hopes of the Soviet materialize, 40,000 tons of this total will be domestic synthetic rubber.

Little has been published as to the technicalities of the methods of synthesis to be adopted, but it is known that they all utilize ethyl alcohol as the raw material. Before the war, comments *Die Chemische Industrie*, Russia produced annually some 16.85 million hectolitres of alcohol, calculated on the basis of the 96° product, this pre-war output being utilized almost exclusively for edible purposes. In 1930 the alcohol production, on the same basis as above, was 11.07 million hectolitres, whilst today the output is believed to be somewhat higher. For the production of 40,000 tons of synthetic rubber, at least 7.38 million hectolitres of alcohol are necessary, a quantity which, considering the other demands for alcohol, is evidently not available today in Russia. In the year 1929 the potato harvest produced a yield of 19.43 hectolitres of alcohol per hectare, but efforts are now being made to raise the starch content of the potatoes from an average of 12-16 per cent to 20 per cent, and further, to increase the crop of potatoes per hectare from 10 to 16.5 tons, which will mean a yield of 49.2 million hectolitres of alcohol per hectare. To supply the needs of the synthetic rubber industry alone will need the intensive cultivation and utilization of 150,000 hectares of potato land; and the possibility of this is, comments *Die Chemische Industrie*, doubtful.

It is reported that the alcohol stocks of the existing synthetic rubber factory, that at Jaroslawl, are already practically depleted. The second factory, namely, that at Woronesch, should have started operations this month, whilst the third factory, at Jefrenow, is also practically on the point of completion.

Supplies Lacking and Quality Poor

In the Russian press itself the argument is advanced that attempts should be made to produce the alcohol necessary for synthetic rubber, from raw materials other than potatoes. Sulphite-cellulose lye, in particular, is advanced as an alternative material, as it is estimated that the quantity of this lye at present produced in Russia is sufficient to be worked up into 150,000 hectolitres of alcohol per year. Other commentators in the Russian press suggest that serious efforts should be made to produce synthetic rubber from raw materials other than alcohol. It is impossible to gain from the Russian press a reliable idea as to the technical success or otherwise of this synthetic rubber, but apparently a lively controversy on the subject is at present proceeding between the rubber-manufacturing and the synthetic-rubber interests. Sufficient synthetic rubber was, it seems, to have been available from Jaroslawl to supply the "Kautschuk" factory at Leningrad with three tons a month for working up in its special experimental plant. It seems, however, that deliveries of synthetic rubber have fallen short, whilst the rubber articles manufactured with its aid have been found below standard quality to the extent of 60 per cent. The blame for this poor material is laid at the door of synthetic rubber by the Rubber Trust, whilst the synthetic-rubber interests claim that the fault is due to defective manufacturing practice at the Kautschuk plant. Altogether, comments *Die Chemische Industrie*, it is extremely doubtful whether the anticipated Russian production of 40,000 tons of synthetic rubber in 1933 will at all materialize.

Status of Varnishes and Lacquers for Rubber Footwear*

By D. D. WRIGHT

VARNISHES and lacquers are applied to rubber footwear to produce and maintain a better appearance for both display and wear, to create decorative effects, and in some cases, to give a more desirable feel to the article. There is room for much improvement in these finishes for footwear, especially with regard to adhesion to the rubber, elasticity, and toughness of film. In short, the ideal is a film that possesses most of the physical properties of the rubber together with those properties that contribute to appearance and feel. This paper is an attempt to explain the physical requirements for varnishes and lacquers for rubber footwear, the difficulties that are encountered and the new properties desired.

*Abstract of paper presented before the Paint and Varnish Division, A.C.S., Denver, August 24, 1932.

*A Method for the Purification of Rubber and Properties of Purified Rubber**

By A. T. McPherson
U. S. Bureau of Standards

THE method of purification used in the following studies was one in which the non-hydrocarbon constituents of the raw rubber were removed by extraction, the proteins being first hydrolyzed by digestion with water at an elevated temperature. The solvents with which the rubber was extracted were water and alcohol. These removed the protein disintegration products, sugars, fatty acids, and other resinous and minor constituents, and yielded a product which was about 99.5 per cent rubber hydrocarbon. While this method of purification involves no distinctly original features it is here given in some detail, since it may be of interest to other investigators who may wish to prepare for experimental purposes large quantities of rubber hydrocarbon of reasonable purity without an excessive expenditure of time.

The dielectric constant, power factor, and conductivity of purified rubber prepared from different kinds of crude rubber were relatively consistent, and showed no variations which might be attributed to the botanical source or kind of rubber.

Description of the Purification Process

Various procedures were tried for the purification of rubber from latex or crude rubber. The procedure which proved the simplest and most generally satisfactory consisted in digestion with water, extraction with water and with alcohol, and drying in an inert gas.

Crude rubber or latex was digested with water at an elevated temperature in an autoclave. The crude rubber, in lots of several kilograms, was sheeted thin and put into a Pyrex glass cylinder with sufficient water to cover it. The cylinder was placed in the autoclave in such a way that the rubber was not exposed to contamination by iron or copper salts from the autoclave or its fittings. Since the autoclave was heated by means of steam circulated through a jacket a quantity of water was placed at the bottom of the autoclave to facilitate heat transfer to the pyrex jar and its contents. Ammonia-preserved latex, when used instead of crude rubber, was placed in the pyrex cylinder with no previous treatment other than straining. The autoclave was heated to about 190° C., which is the temperature of steam at a pressure of 167 pounds per square inch in excess of atmospheric pressure. The time of digestion was ordinarily three to four hours exclusive of the time required for heating and cooling the heavy autoclave. The time and temperature of heating were probably in excess of that necessary to hydrolyze the proteins, but were employed in order to insure thorough penetration of the crude rubber by the water.

At the conclusion of the digestion the water in which the rubber had been heated was dark colored and contained considerable organic matter. When latex was employed it was always found coagulated after digestion. A hand examination of the digested rubber indicated that the digestion process did not soften or degrade the rubber to any great extent.

The digested rubber was washed and extracted in order to remove protein disintegration products, resins, sugars, soluble inorganic salts, and possible mechanical impurities. The washing and extraction were carried out with the use of an internal mixer of a type which was designed for the compounding of rubber. The mixing chamber was provided with a cover fitted with a reflux condenser to prevent the loss of solvent. The mastication of the rubber with the solvent in the internal mixer was a much more effective means of removing these various impurities than was percolation of the thinly sheeted material with the solvent in an extraction apparatus. The chief advantage of the internal mixer lay in the constant renewal of the surface of the rubber. This facilitated the removal of any mechanical impurities and pockets of solution, and probably accelerated greatly the extraction of substances slightly soluble in rubber. Furthermore, the use of the internal mixer obviated various difficulties which are attendant on the extraction of soft rubber in lots of several kilograms in an apparatus of the Soxhlet type.

The process of washing and extracting the digested rubber with water usually occupied 4 hours, during which time the water was changed every 15 or 30 minutes. Distilled water was used, and was kept vigorously boiling in order to exclude air and thus prevent oxidation of the rubber. At the end of the period the wash water was comparatively colorless and left only a very slight residue on evaporation.

Treatment with water was followed by a similar treatment with alcohol. For this purpose ethanol, containing not over 5 per cent of water and 10 per cent of methanol, was used. Alcohol was employed as a solvent for extracting the resinous constituents of rubber rather than acetone on account of its higher boiling point. When rubber was extracted with acetone at its boiling point, 56° C., a soft and almost pasty product was obtained on account of the mechanical working of the rubber at the relatively low temperature.

Extraction with alcohol was followed by a few minutes extraction with one or two portions of boiling water in order to remove the alcohol. This was done because, in the subsequent drying, it seemed easier to remove the water than the alcohol. This point, however, was not investigated critically.

The extracted rubber was dried by working it in the internal mixer at a temperature of 110° to 125° C. in an atmosphere of inert gas, usually nitrogen. A continuous stream of gas was passed through the mixer during the drying, which was ordinarily continued for about 30 minutes after steam had disappeared from the effluent gas.

Composition of the Purified Rubber

No extensive study was made of the composition of the purified rubber. Determinations of nitrogen, benzene-insoluble constituents, and ash were made on representative preparations. Combustion analyses of high precision were made on two samples of the purified rubber.

Nitrogen was determined by the Kjeldahl method, using 2 g samples of rubber. The results of analyses on rubber before and after purification are given in Table 1. The nitrogen content of the original unpurified rubber was 0.3 to 0.6 per cent, while that of seven lots of the purified material ranged from 0.02 to 0.05 per

*Research Paper No. 449. Reprinted from *Bureau of Standards Journal of Research*, Vol. 8, June, 1932, with due acknowledgment.

cent, with an average value of about 0.03 per cent. The precision of the determination was of the order of 0.01 per cent.

Determinations of ash were made by igniting 5 g samples of rubber in crucibles of approximately 100 ml capacity in an electrically heated muffle furnace, observing the usual precautions. In most cases an appreciable reduction in ash content resulted from purification. Only in the case of a sample of Guayule rubber was there a small increase in percentage of ash. This may have resulted from the removal of a larger proportion of resins than of inorganic material in the purification process. The ash content of purified rubber made from clean plantation rubber or latex ranged from 0.04 to 0.24 per cent, with an average of about 0.12 per cent. Analyses made by ignition in a muffle and in a combustion furnace were in good agreement. Seven determinations on one preparation, by the former method, indicated an ash content of 0.15 ± 0.02 per cent, while five determinations by the latter method, which are reported in Table 2, gave the result 0.13 ± 0.03 per cent.

The benzene-insoluble fraction of rubber was determined by dissolving 5 g samples in 50 to 100 ml of benzene to which about 1 g of trichloroacetic acid had been added. On exposure to light for a few hours a limpid solution was obtained from which proteins, salts, and foreign materials, such as dirt or bark, could easily be separated by centrifuging. The residue was thoroughly washed with benzene and dried before it was weighed. The results which are given in Table 1 indicate that the original unpurified rubber contained form 2.5 to 5 per cent of insoluble material, and the purified rubber 0.1 to 0.3 per cent.

Table 1.—*Composition of rubber before and after purification*

Source of rubber	Preparation No.	Nitrogen		Benzene-insoluble		Ash	
		Before purification	After purification	Before purification	After purification	Before purification	After purification
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Smoked sheet	3	0.29	0.02	2.50	0.18	0.18	0.08
Guayule[1]	...	.30	.05	8.1	.....	1.03	1.27
Pale crêpe	6	.31	.02	.....	.....	.16	.14
	7	.....	.03	.....	.....	.....	.....
	8	.....	.03	.....	.....	.....	.....
	10	.....	.02	.....	.....	.....	.07
Later-sprayed rubber	4	.62	.02	5.35	.26	1.4	.24
Hevea latex	11	.....	.02	.....	.....	.....	.04
	14	.....	.....	.....	.....	.....	.15
	[2] 19	.....	.004	.....	.33	.....	.19
	[3] 23	.....	.....	.....	.13	.....	.08
	[3] 27	.....	.....	.....	.31	.....	.....

[1] The Guayule rubber was digested with 4 per cent potassium hydroxide solution instead of water to destroy woody matter
[2] This sample of purified rubber was prepared by A. D. Cummings using the method of Cummings and Sebrell, Ind. Eng. Chem. vol. 21, p. 553, June 1929.
[3] These samples were prepared and analyzed by A. D. Cummings.

Organic combustion analyses on three preparations of purified rubber were made with an apparatus capable of giving results of relatively high accuracy. The results are shown in Table 2. The sums of the carbon, hydrogen, and ash found in the different analyses ranged from 99.82 to 100.06 per cent, with an average value of 99.95 per cent. Assuming the nitrogen content to be 0.03 per cent, the oxygen indicated by difference is only 0.02 per cent. This is evidence that practically all the resins and nonhydrocarbon constituents were removed by the extraction process, and that the rubber did not suffer appreciable oxidation in the process of purification.

Table 2.—*Combustion analyses on purified rubber*

Source of rubber	Analysis No.	Carbon	Hydrogen	Ash	Total
		Per cent	*Per cent*	*Per cent*	*Per cent*
Pale crêpe	1	87.87	11.76	0.19	99.82
	2	87.75	11.95	.25	99.95
Hevea latex	1	87.99	11.89	.18	100.06
	2	88.05	11.87	.10	100.02
	3	87.95	11.87	.10	99.92
	4	87.94	11.85	.15	99.94
	5	88.01	11.86	.10	99.96
Calculated for C_5H_8		88.15	11.85	.....	100.00

The above data does not warrant an exact statement of the purity of the rubber. If it is assumed, however, that the chief impurities are inorganic substances, proteins, or their degradation products and moisture, the sum of these is probably not in excess of 0.5 per cent, or the hydrocarbon content of the rubber may be estimated at about 99.55 per cent.

Properties of the Purified Rubber

The purified rubber was dark in color, except when viewed in thin layers. The colored constituents were probably present in small amount and originated during the digestion with water at the high temperature.

No measurements were made of the consistency of the purified rubber. By hand examination it seemed to be comparable to or somewhat softer than crude rubber which had been thoroughly masticated or "broken down." The consistency was probably the result of the mechanical working accorded the rubber during the extraction and drying.

Determinations of the density and the refractive index were made on single samples of the purified rubber which had been prepared from latex. Dielectric constant, power factor, and conductivity measurements were made on all samples of the purified rubber.

The density of the purified rubber was determined at three temperatures with the use of a Pyrex glass pyknometer in which mercury was employed as the confining liquid. The density at 0° C. was 0.9209; at 20°, 0.9088; and at 61.2°, 0.8845. These values, when plotted against the temperature, lie on a straight line within probable experimental error, as is indicated by Figure 1. The density at 25°, taken from the curve in this figure, is 0.9060. The coefficient of change in density with temperature is 0.000595 per degree, between 0° and 61.2°, or the density at any temperature, t, in this range is given by the relation,

$$d_t = 0.9060 + 0.000595\ (25 - t)$$

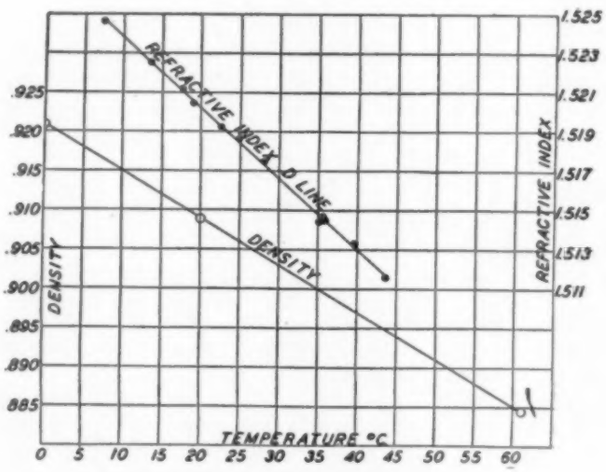


Figure 1—Density and Refractive Index of Purified Rubber

By way of comparison the density of standard grades of commercial crude rubber at 25° C. is about 0.912, and the change in density per °C. is 0.00062.

The refractive index of the purified rubber for the D line of sodium was measured with an Abbé prism refractometer. Thin specimens suitable for measurements in this instrument were prepared by pressing out small sheets of rubber between layers of aluminum foil. These were applied to the prism and pressed against it so as to make optical contact without the use of a liquid. The temperature at which the determinations were made was controlled by circulating water around the prisms. The results which were obtained at temperatures from 7° to 43° C. are shown graphically in Figure 1.

The refractive index of the purified rubber for the D line at 25° C, taken from the curve in Figure 1, is 1.5184, which is approximately the same as the value 1.519 reported previously for crude

rubber.[4] The refractive index at temperatures other than 25° C. is given by the relation

$$n^t_D = 1.5184 + 0.00036\ (25 - t)$$

The experimental results agree with the values indicated by this equation with a maximum deviation of 0.0004 and an average deviation of 0.0001.

Dielectric constant, power factor, and conductivity measurements were made on samples of purified rubber which had been prepared not only from wild and plantation Hevea rubber, but also from other natural rubbers of widely different botanical sources. The method of preparing test specimens and making electrical measurements is described fully elsewhere.[5] The results of these measurements are summarized in Table 3.

The dielectric constant at 1,000 cycles per second and 25° C. of all the samples of purified rubber which were examined was between 2.33 and 2.40, with an average value of 2.37. The dielectric constant of the unpurified rubber is higher and more variable than this, ranging from 2.50 to 2.70 in most cases. The value, 2.37, probably approximates the dielectric constant of pure rubber hydrocarbon.

The power factor of purified rubber measured at 1,000 cycles per second was less than that of rubber before purification, and ranged from 0.0008 to 0.0026, with an average value of 0.0015. This variability, in the light of general knowledge of power factor, may be attributed to residual impurities in the rubber, including moisture. The true power factor of rubber hydrocarbon is probably less than 0.008, the lowest value found, because traces of most impurities are known to increase the power factor of hydrocarbons above the true value.

The conductivity of purified rubber, measured one minute after the application of potential, was decidedly lower and less variable than that of crude rubber. For different samples the conductivity ranged from 1.4 to 3.6×10^{-17} mho, with an average of 2.2×10^{-17} mho. As in case of the power factor the average conductivity is not to be regarded as the true conductivity of a hydrocarbon, since the effect of impurities is always to increase, never to decrease, the conductivity of the main constituent. Consequently, the conductivity of pure rubber hydrocarbon is in all probability smaller than the lowest value here reported.

Table 3.—*Electrical properties of purified rubber at 25° C.*

Kind of crude rubber or latex	Botanical source	Preparation No	Dielectric constant[1]	Power factor[1]	Conductivity[2]
					Mho×10^{17}
Penang	*Fiscus elastica*		2.39	0.0018	2.7
Guayule[3]	*Parthenium argentatum*		2.33	.0011	3.7
Gaboon ball	Probably *Landolphia*		2.40	.0013	3.3
Fine Para	*Hevea brasiliensis*	2	2.37	.0008	1.6
Smoked sheet	do	3	2.36	.0008	1.6
Latex-sprayed	do	4	2.35	.0014	2.2
Pale crêpe	do	1	2.39	.0010	1.7
	do	6	2.36	.0017	1.5
	do	8	2.37	.0016	1.9
Ammonia-preserved latex	do	0	2.39	.0018	2.2
	do	11	2.36	.0018	2.0
	do	14	2.37	.0014	2.6
	do	27	2.39	.0026	
	do	31	2.41	.0022	1.7
Average for all samples			2.37	.0015	2.2

[1] The dielectric constant and power factor were measured at a frequency of 1,000 cycles per second.

[2] The conductivity was measured one minute after the application of potential.

[3] The purificaton of the guayule rubber used for these measurements included solution in benzene, filtration, and precipitation with acetone to effect the removal of woody impurities.

[4] H. L. Curtis and A. T. McPherson, Dielectric Constant, Power Factor, and Resistivity of Rubber and Gutta-Percha, B. S. Tech. Paper No. 299, p. 698, 1925. See also Cecil W. Shacklock, Further Studies of Rubber Solutions, Inst. Rubber Ind., Trans. vol. 7, p. 356; 1932.

[5] H. L. Curtis, A. H. Scott, and A. T. McPherson, Properties of the System, Rubber Sulphur. Part III. Effect of Temperature and Frequency on the Dielectric Constant, Power Factor, and Conductivity In preparation.

No critical study was made of the vulcanization of purified rubber. Numerous samples, however, compounded with sulphur in proportions from 2 to 32 per cent by weight, exhibited a behavior on vulcanization that was apparently the same as that of similar mixtures of crude rubber and sulphur. When the samples were vulcanized from 20 to 40 hours at 140° C., the residual, uncombined sulphur was less than 0.1 per cent in all cases except those where the total sulphur was 28 to 32 per cent. In the latter cases residual sulphur was present in varying amounts up to 0.8 per cent.

Sound Absorption of Rubber Flooring

AN investigation made in London into the sound-absorptive properties of rubber floorings has developed some interesting results. Nearly 300 samples were collected from nineteen manufacturers, and of these four were selected for large-scale tests. These four types of flooring were: a hard rubber sheet ¼-inch thick; a very flexible sheet ¼-inch thick; a spongy rubber sheet ¼-inch thick, with a 1/16-inch surface layer; and a much softer sponge sheet, otherwise similar to the third type.

From reverberation tests made by the National Physical Laboratory, it may be concluded that the sound-absorption coefficient of rubber flooring lies between those of the hard types of floor and of the carpet class. Excluding the latter for obvious reasons of lack of hygienic and durable properties, rubber is as useful as any other flooring material for sound-absorption, and considerably better than many of them. The softer sponge floorings were definitely more absorbent than the other two, but in general it can be said that there is no justification for the idea that rubber flooring is essentially unsuitable for auditoriums.

At a conference organized by the Rubber Growers' Association and the Research Association of British Rubber Manufacturers to discuss this investigation, the foregoing conclusions were wholeheartedly endorsed by cinema-acoustic engineers, who considered that the objections to rubber flooring in regard to reverberation had undoubtedly been over-emphasized in the past. They pointed out that there is a dearth of hygienic material of good sound absorbing quality, and that rubber is one of the most hopeful materials for applications of this kind.

Hydraulic Platen Presses

THE accompanying illustration shows six 30" x 30" National-Erie all-steel hydraulic platen presses, of extra heavy construction, with 18" rams and furnished with rolled steel platens drilled from solid, which were recently shipped and installed in an Akron rubber factory.

These presses are made entirely of steel with exception of rams which are close grained chilled cast iron, turned

and polished. The cross head, cylinder, ram table and packer gland are made from high grade electric cast steel. Strain rods are constructed from special alloy steel with an analysis of more than 90,000 lbs. per sq. in. tensile strength.

Should We Attempt to Meet Competition of CHEAP FOREIGN RUBBER GOODS

By FREDERICK J. MAYWALD*

THE domestic rubber business today is suffering very badly from a situation brought on not only by the economic depression which has been prevailing throughout the world, but by the flood of cheap rubber goods imported into the United States from Japanese, Hungarian, Czechoslovakian and other foreign sources. The domestic manufacturer rightly asks himself "How do they do it at the prices their goods are offered on the American market?" In some cases one wonders how the price at which the goods are sold, will pay even the freight, much less the cost of manufacture.

We have called it "dumping," but is it? Are we measuring this foreign merchandise by the same quality value as are present in our domestic product?

How many manufacturers have taken the trouble to pull apart some of these foreign rubber goods and really found out what they consist of and how they were manufactured?

Low Wages and Living Standards

Of course we must always bear in mind that the depreciated foreign currencies and the lower standards of living abroad help the foreign manufacturer to bring down costs to well below domestic costs, but this is not the real answer. The answer is in the inferior quality of the foreign product. If you will examine some of the Japanese toy balloons which have been offered in this country you will find that they are of a thickness of only two or three one-thousandths of an inch instead of our own heavy American gauge; that many are hand built and not dipped; that they are under-cured, and that nine times out of ten one cannot blow them up to anything like the size of our American balloons. Take your Japanese rubber over-shoes, and other articles of this same sort, and look at the crudeness of the workmanship exhibited. Try them as to tensile strength, wearing qualities, etc., and you will find that they are not in the least comparable with American goods.

To cite another instance, let us examine a toy chicken of Hungarian manufacture. The body of the chicken is of very light gauge and made by the dipping process. In the bottom of it is placed a whistle, consisting of a sheet of rubber and a little wooden whistle, which serves to close the opening caused by the mold used to dip or form the toy.

Next let us consider a Czechoslovakian toy. As far as first appearances go, it is a fairly good looking toy, being air-brush painted in two colors, but when you examine it you find that the body is very crudely molded and molded in the very cheapest possible way and with the very poorest grade of materials, and that it will tear and break up with but little handling.

Recently a ten cent sponge of German manufacture, made up of three colors of sponge rubber, has appeared on the market. A slight examination showed that it was made up of scrap and that instead of being a solid sponge, it was a "case" filled with trimmings, clippings and scraps, and the only bathing virtue in the article lay in the thin 1/4th inch size of genuine sponge rubber attached to the outside.

Many an American manufacturer would justly feel that were he to attempt to sell a grade of goods similar to these, he would be promptly turned down. The American manufacturer has not been in the business of making low grade, cheap goods. His American standards of living and those of his labor have prompted him to want the best for himself and thereby make the best for his customers. But times have brought a change, at least temporarily. The economic depression has caused us to pause in our purchasing, buy make-shift things, secure the cheapest, even at the expense of utility and certainly in utter disregard of quality.

The fact that this mess of foreign "junk" can be sold in the American market proves very clearly that there is a demand for this cheap class of goods at this time. The importation of such goods proves that the agents of the foreign manufacturers have seen that market and have filled it, while the American has unfortunately failed through trying to maintain quality. There was a time when the axiom of "how good" instead of "how cheap" was a real selling point. But market conditions have changed and that in many cases today the question is "how cheap" and the virtues of quality are forgotten. In other words, the average person will rush to a ten cent store and buy half a dozen "junk" articles, where formerly he wanted a good article. Prior to 1929 the average drug store could not sell a box of face powder for less than $1.25 to $1.50 because the public had the idea that the cheap article was no good, and they wanted to brag to their friends on how much they paid for their face powder, while today the druggist finds his shelves filled with this $1.25 and $1.50 face powder for which he has no market, while the public is paying only 25 and 50c for cosmetics.

Cheap Domestic Goods in Demand

Every indication points to the fact that we have turned the corner, but manufacturers must realize that we are not going to turn it at a speed of one hundred miles per hour and that we have to begin educating the public again to high priced goods. We probably have to start manufacturing smaller and cheaper articles in most lines of rubber goods to meet the competitive foreign goods. Also it behooves manufacturers to supply whatever grade of goods the buyer wants instead of forcing on him what that manufacturer wants to sell—irrespective of quality.

Manufacturers might sit down and ponder over these few random remarks, and then attempt to meet domestic demand and foreign competition, as far as possible, on its own footing. It is quite true that we must have a sufficient tariff to help keep out these foreign goods, but first, the manufacturer must learn that he must furnish the public with what it wants, and labor must learn that it cannot expect war-time wage scales. At the same time, manufacturers, jobbers, and dealers must learn that the days of excessive profits, which they have been getting, in many cases are past for quite a while to come. To get the wheels of the factories going we all must work together. Certainly rubber is cheap enough to enable manufacturers to produce goods at moderate prices these days.

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EDITORIAL COMMENT

Ford Comes Through Again

IT IS reported through a special news dispatch to the *Wall Street Journal* that the Ford Plantation Company, the Brazilian rubber project and subsidiary of the Ford Motor Company, will soon start to market products from its Amazon concession. The first shipment of commercial products recently arrived in this country from Boa Vista, the headquarters of the plantation operations. It consisted mainly of logs and lumber, but rubber and fibres from tropical trees were included. The lumber, amounting to 160,000 board feet, is the first kiln-dried material ever to be shipped out of Brazil.

In 1927 the Ford Motor Company acquired a tract of approximately 4,000,000 acres of jungle land in the Amazon Valley, Brazil, for development as a rubber plantation. As the dense jungle was cleared preparatory to the planting of rubber seedlings, many trees were felled and hauled to the plantation sawmill for conversion into lumber which was used for plantation buildings and for houses for the white and native workers. Some of these buildings contain woods which are said to be more beautiful than many used in the choicest examples of present American cabinet work.

Soon after the clearing was started, Ford specialists began to investigate the possibilities of commercial use of these woods. Almost four years of experimental work by the Ford Motor Company, both in Dearborn, Mich., and on the Ford Brazil plantation preceded the first shipping. Exhaustive scientific inquiries into the qualities of the various woods were conducted. They were tested for relative weight, strength, hardness, moisture content, resistance to deterioration, adaptability to interior trim, veneering and cabinet making and also for their ability to take stains, wax and varnish finishes.

These experiments, recently completed, revealed that these new woods were readily adaptable to processing and in many respects were superior to domestic materials for the entire field of fine cabinet work.

Most of the woods range from 28 to 56 pounds a cubic foot. Another, of the balsa type, weighs less than 7 pounds a cubic foot. Woods of this type are expected to prove to be of great utility in sound-proofing and insulation.

The first commercial use of this imported lumber in the United States will be in the new service branch of the Ford Company at Alexandria, Virginia, now being built to serve the Washington, D. C., territory. Kiln-dried lumber also will be supplied to manufacturers for conversion into furniture for the new plant offices.

Some of the woods will be used in automobiles made by the Ford Motor Company. One use is to be in the interior decorative moldings of Lincoln cars, which previously have been fashioned of woods imported from northern South America, Central America and Europe. The company also will use some of these woods in the manufacture of patterns, forms and models, replacing the woods now used.

Among the first consignment were stumps and crotches of trees found on the Ford plantation. These are to be used in the manufacture of burl veneers to indicate the possibilities which the Brazilian woods offer.

The Ford saw mill at Boa Vista has a capacity for 90,000 board feet a day.

More Evidence of Revival

COLONEL AYRES' comment is always interesting and especially when he strikes so optimistic a note as he does in the following recent summary of conditions:

"Recovery from the financial panic is well under way, but recovery from the business depression has made little progress as yet. The two things are very different. The depression is a long period of subnormal business activity. This one was ushered in by a stock market panic in the autumn of 1929, but in 1930 while the depression was becoming serious both stock prices and bond prices recovered to the prosperity levels of early 1929. The financial panic began late in 1931 after England left the gold basis for her currency. It developed into wide-spread fear concerning the safety of banks, the integrity of the dollar, and even the valdity of financial commitments in general.

"The recovery that is now under way is the recovery from the financial panic. It had to come before recovery from the business depression could be a possibility. In the two months following the first week of July the average prices of stocks advanced 100 per cent, those of the railroads moved up 200 per cent, and many individual issues increased in price from five to ten times. Few complete bull markets of the past have recorded such great percentage advances, and on no former occasion has there been so violent an increase in so brief a period."

The RUBBER AGE

Published on the 10th and 25th of each month. The Only Twice-a-Month Rubber Publication.

THE PALMERTON PUBLISHING CO., INC.

Editorial Office, 250 West 57th St., New York City

Telephones: COlumbus 5-2923, 5-2924

THE RUBBER AGE is published on the 10th and 25th of each month by The Palmerton Publishing Co., Inc., a New York corporation. P. L. Palmerton, President; Earl D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer. Publication Office, 1-3 Peace Street, New Brunswick, N. J. Subscription rates: Domestic, $2.00 a year; Canada, $3.70; foreign, $3.00; single copies, up to 3 months old, 20c; over 3 months old, 50c. Advertising rates on application.

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THE RUBBER AGE is indexed in *Industrial Arts Index*

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

RUBBER PLANTATION TO BE AT WORLD'S FAIR

At the invitation of the exposition, Firestone Tire and Rubber Company will reconstruct a miniature rubber plantation in the Hall of Science.

It now is collecting the elements of the exhibit. A 15-year-old giant of the rubber forests, *hevea brasiliensis*, has been brought from one of the older sections of the Firestone Liberian grant.

Stacy G. Carkhuff, secretary of Firestone Tire and Rubber Company and in charge of raw materials supply for Firestone, says the Chicago exhibit will show how latex is drawn from the tree, collected into buckets, coagulated into crude rubber, and eventually prepared for shipment.

Exhibits in the Hall of Science are by invitation only. The Firestone display there will be in addition to another, where it plans now to set up a tire assembly line and actually manufacture tires.

The tree brought to Akron for eventual shipment to Chicago has mechanism concealed within its trunk to keep the latex flowing in simulation of the actual process.

New Rubber Exchange Members

The following have been elected to membership in the Rubber Exchange of New York, Inc.

Louis de L'Aigle Munds of Munds, Winslow and Potter, 25 Broad street, New York.

Samuel Thomas Hubbard, Jr., Hubbard Bros. and Company, 66 Beaver street, New York.

Udo M. Reinach, Ira Haupt and Company, 39 Broadway, New York.

John W. Meyer, 1178 Board of Trade Building, Chicago, Ill.

Theodore F. Bernstein, Carl M. Loeb and Company, 48 Wall street, New York.

Joseph Klingenstein, Wertheim and Company, 57 William street, New York.

Lloyd H. Smith, 1 Wall street, New York.

Pharis Adds Equipment

In order to meet further capacity demands on their production schedule, the Pharis Tire and Rubber Company, Newark, O., report that they have recently installed an additional 500 horsepower boiler with automatic stoker equipment, in their factory.

The company has kept its plant in steady operation throughout the depression, and during the past several months has maintained a twenty-four-hour day, seven days a week schedule to keep up with the demand.

Vodka Makes Rubber

It is reported that the Russian Soviet Government has found a new use for the strong drink vodka—it is being converted into synthetic rubber. The newspaper *Izvestia* announces the opening of a second synthetic rubber factory at Voronezh—there is already one at Yaroslav—and two more will be finished next year in Kazan and Efremof, which are expected to supply the country fully with automobile tires and tubes.

Izvestia declares the Soviet Union is the only country now producing synthetic rubber, although such production was attempted in Germany during the war, but was abandoned at the close of hostilities. The Soviet production follows a process discovered by Professor Lebedeff in Leningrad in 1930, requiring a quantity of pure alcohol.

Next month the Central Asian factory for the production of rubber from the root called "tausagiz" is expected to begin operations with a daily capacity of sixty tons.

Capture Tire Hi-jackers

Police of Cleveland, O., are reported to have captured four of a gang of seven, which executed a $5,000 tire hi-jacking robbery near Litchfield, O., several weeks ago.

Police prepared to surrender the captives in the tire theft case to department of justice agents for federal prosecution, since they are held for looting a truck in interstate commerce. They were reported to have admitted the theft.

The tire truck was en route from Akron to Longview, Tex., when the gang descended upon it. Two of the highwaymen, holding the truckmen, Adolph Hahn of St. Louis and Joseph Dever of Dallas, Tex., at gunpoint, drove with them in the bandits' car toward Cleveland. The other five commandeered the truck.

A Correction

The India Rubber, Gutta Percha and Telegraph Works, Ltd., famous British makers of golf balls, through their subsidiary, the Silvertown Company, call our attention to an error in our issue of August 25, wherein we give the impression that "American-type" golf balls out distanced the British. In the demonstration the "American-type" balls used were actually of British manufacture—made by the Silvertown Company to U. S. G. A. specifications of 1931 and 1932.

SEVERE TIRE TESTS IN IMPERIAL VALLEY

More than eight months of intensive tire testing on the burning pavements of Imperial Valley in California ended recently when trucks of the B. F. Goodrich Company's famous "Silver Fleet" returned to Akron headquarters with a mass of tire data obtained under tremendously severe operating conditions. For days, temperatures ranged between 112 and 120 degrees, imposing the hardest possible test on tires, as well as drivers.

Heavily loaded and operating at high speeds, the trucks traveled day and night, averaging approximately 750 miles each 24 hours. All operations were on paved roads in order that high speeds might be maintained as constantly as possible.

Time was taken out only for the necessary checking of air pressure, meals and changes of drivers, mechanical attention to the trucks and to substitute other tires for testing. Tires were subjected to considerable overloading, under varying pressures, to make the tests as severe as possible.

Aetna Rubber Busy

Working on a 24-hour-a-day basis, the Ashtabula, O., plant of the Aetna Rubber Company is running near capacity with 400 employed. A portion of these workers are on three eight-hour shifts per day and others are working four six-hour shifts in order to distribute the work over a larger number of workers.

The company has met the economic situation by conducting a vigorous campaign to procure additional business and that it has succeeded is indicated by the fact that not only is it doing an unusually satsfactory domestic business but its export business has been well maintained.

Corduroy Adds 250 Dealers

Corduroy Tire Company broke all records for new dealer contracts the first 10 days of September when 229 were listed. There were from six to twelve new contracts daily; on September 6 the number was 34 and the high point was reached September 8 with 65 new contracts.

Increased distribution represented 25 different states, indicating a general improvement in business. In spite of heavy production all surplus stocks of five of the most popular tire sizes were sold out, the plant working at capacity, according to L. B. McCourt, director of sales.

1932 AUTO OUTPUT WILL APPROXIMATE 1,500,000

Reports from automobile manufacturing centers would indicate that preparations are going slowly forward towards work on new models, but no drastic moves have been made within the last fortnight. This does not mean, according to a survey of the *Automotive Daily News,* that production has ceased on present models, but it has undergone the normal seasonal reduction. The Ford plant is turning out eights and fours at the rate of 2,000 or more a day four days a week.

Judging from the meager facts at hand, Ford production during September will run to something like 30,000 units. This estimate credits the organization with slightly over 2,000 units for fourteen working days in this month. The River Rouge plant did not get into production again until September 7 after its three weeks of idleness. It is possible that Ford may exceed the estimates generally accepted here for September production. It will be remembered that in August he exceeded estimates by a sufficient number to give the industry a total output of more than 89,000 units instead of the 75,000 that had been anticipated.

General Motors, Chrysler and other plants are continuing production on a moderate basis while plans for the future are maturing.

Dopesters are trying to figure production for the final quarter of this year for the industry as a whole. None of the estimates offered has any basis in actual schedule announcements, for none of the manufacturers has given out anything of the sort. All the vehicle builders are holding production so rigidly to actual demand that they do not know what they will build even a single month ahead.

Many of the companies have set schedules of production of new models for dealer sampling and for stock to meet initial demand, but no official word has been given out on this.

According to the best informed opinion, production by the whole industry in the final quarter of 1932 will probably run to about 300,000 vehicle units. If September production is placed at 70,000 vehicle units, it will probably not be far out of the way.

This gives a rough estimate for the final four months of 1932 of 370,000 vehicle units for the industry. There is already in hand the figures for the first eight months of the current year, with a total of 1,119,558 vehicles. This would give a total production for 1932 of approximately 1,500,000 units.

Scrap and Reclaimed Rates

Due largely to its efforts, the National Association of Waste Material Dealers, Inc., has been pleased to announce that the proposition to make the rates on scrap rubber, carloads, within Trunk Line and New England territories, and from those territories into Central Freight Association territory on basis of 20 per cent of first class, in lieu of the present basis of 27½ per cent of first class, has just been approved for publication by the General Freight Agents' Committee of the Trunk Lines. It will become effective at an early date within Trunk Line territory, but before it can be published into New England and Central territories the concurrences of those Associations are necessary. It is not contemplated that there will be any resistance to the proposition.

As to the rates on reclaimed rubber, the sixth class basis sought for was published to expire on December 31, 1932. However, as the result of protests to the carriers, the expiration date has been extended until December 31, 1933.

These substantial reductions in the rates on scrap and reclaimed rubber should go a long way towards staging a comeback in the trade.

Firestone's Spanish Plant

Confirmation of the report that the Firestone Tire and Rubber Company would operate a tire factory in Spain has come in the form of a brief announcement by Harvey S. Firestone, Sr., upon his recent return from Europe. Meager details have been made available to date but it is understood that the project will have the financial backing of several Spanish banks and will employ 500 workers.

Foote Bros. Operations

Abel Davis and Franklin H. Fowler, Receivers in Equity for Foote Brothers Gear and Machine Company, Chicago, Ill., announce that arrangements are being made with the approval of the Federal Court to move all manufacturing operations of the company now being carried on at the Curtis Street Plant, to the Plamondon Division at 5301 South Western Avenue, Chicago. At the same time some surplus machinery will be disposed of.

This consolidation of manufacturing operations of the gear and reducer division in one modern, up-to-date plant, will effect great savings in production costs and operating expenses and will speed up deliveries considerably.

The Plamondon plant, a new one story plant of very large floor area, is located on a siding of the Chicago Belt Line Railway. It is expected that the move will be completed by about October 1st, 1932.

Rubber Stock Quotations

	Last Price		—1932—	
	Sept. 20	Sept. 6	High	Low
Aetna	2	—	3	1½
American Hard Rubber	—	11	—	—
Faultless	22	—	25	12
Firestone	13	16½	18½	10¾
do 6% pfd.	59	—	59½	45½
Fisk	¼	⅝	⅝	⅛
do. 1st pfd.	¾	1⅞	2⅜	¼
General	37	—	45	25
do. pfd.	44	—	—	—
Goodrich	7⅝	10⅝	12⅜	2¼
do. pfd.	—	12¼	33	7
Goodyear	20¼	26⅞	29¾	5½
do. 1st pfd.	48	64½	69½	19¾
India	6¼	—	7	½
Kelly Springfield	2	2⅜	2⅞	½
do. 6% pfd.	—	—	30	16
Lee	6¼	6⅝	7⅞	2
Mohawk	2½	4	4	1
do. pfd.	29	—	—	—
Norwalk	1⅝	2¼	2½	⅝
Pirelli	33⅛	—	31⅝	21
Raybestos-Manhattan	8	11⅝	12¾	4⅞
Seiberling	—	4½	4½	1
do. pfd.	21	—	22	7
Thermoid	3	2½	3	⅞
U. S. Rubber	6¼	9¼	10¼	1¼
do. pfd.	12	18	20¾	3¾

HOOD'S SALE HAS NO EFFECT ON TIRE CORP.

Recently announced purchase of the common stock control of the Hood Rubber Company, Inc., from the B. F. Goodrich Company by principal executives of Hood does not affect the Hood Tire Corporation, Akron, O., it is pointed out by H. E. Keller, vice-president of the latter.

"Hood Rubber Company, Inc., has in no way had any control over or capital stock interest in Hood Tire Corporation since this company's organization in April, 1930," Mr. Keller declared. "The change, which has taken place, has no bearing of any kind on the manufacture and sale of Hood tires."

August Rim Production Low

Automobile rim production last month dropped to a new low record, according to statistics of inspections and approvals released today by the Tire and Rim Association, Inc. September automobile production, therefore, is likely to hit a low level, as rim production is a fair indication of what to expect a few weeks later on assembly lines.

August rim output, as indicated by inspections and approvals, amounted to only 221,931 standard units, together with another 11,120 of "experimental" rims for use with low pressure balloon tires. In the previous month output was 338,725 standard rims and 13,720 experimental rims.

One year ago in August rim production increased to 924,236, compared with 812,236 in July, dropped in September to 504,879, and in October established a low of 281,749.

Last month's poor showing of 221,913 rims turned out contrasts with 1,570,555 in August, 1929, and with the all-time peak of 2,729,899 in April, 1929.

Rim production figures for last month do not indicate that automobile producers have yet proceeded very far in reported plans to bring out new models earlier than usual. In 1930 and 1931 production of rims dropped off sharply in the two months following August, but it is evident that former performances are no longer a good guide to tendencies today.

New Akron Casting Company

The newly formed Akron Super Steel Castings, Inc., is expected to have its Akron plant in operation shortly. The plant will give employment to 40 men immediately and 300 men when under full operation.

C. F. Adamson, president of the Adamson Machine Company, of Akron, and Adamson Manufacturing Company, East Palestine, well-known suppliers of rubber machinery and equipment is president of the new concern; Norman E. Daub, former general sales manager of Atlantic Foundry Company, Akron, is vice-president, and C. B. Mitchella, general manager of the Adamson Machine Company, is secretary-treasurer.

Foundry supervision will be in charge of Fred Hays and Harry Orr, originally with the Atlantic Foundry Company.

The company will operate entirely independently of the Adamson Machine Company, although it has leased the steel foundry and equipment of that concern.

Names in the News

Fred S. Wilson

Fred S. Wilson, 55 years old, former vice-president of the Thermoid Rubber Company, committed suicide, September 1, by shooting himself in his office at Los Angeles, Cal. He left a note declaring that financial difficulties were the cause of his act. The day previous he had been defeated for the office of supervisor of Los Angeles County.

Mr. Wilson moved to Santa Monica, Cal., twenty years ago when he became Pacific Coast representative for the Thermoid Company. He first started work with this organization at the age of 16 as a tire maker and advanced rapidly. Before he was 25 years old he was made factory manager. He was on the road in the Eastern States for several years and in 1910 became sales and advertising manager of the company. During this period he resided in Trenton, N. J., where he was active in financial, educational and civic development of the community. About nine years ago Mr. Wilson took up oil refining and became head of a large oil refining concern in California. The deceased leaves three brothers and a sister, all living in Trenton.

Fred L. Killian

A fatal automobile accident outside of Akron on September 13, caused the loss to the industry of Fred L. Killian, well-known in rubber circles.

During his early years in Akron he obtained wide experience in the rubber industry working at the B. F. Goodrich Co., the Miller Rubber Co. and the Kelly-Springfield Tire Co.

Finding himself out of a job in 1914 he started a small shop with only three girls on the pay roll. This industry, in which three of his brothers later joined him, had grown at the time of his death to employ 250 persons.

Fire on January 14, 1931, destroyed the plant at Krumroy, and fatally burned Killian's brother-in-law, Albert Ortlauf. The plant was reconstructed and is one of the largest exclusive rubber sundries factories in the world. The packing plant and office is located at 1034 S. High street.

Although he avoided publicity in the matter, Killian's many private acts of charity won him many friends. It was legend that if one were "up against it" Fred Killian would help out. A number of Akron business men owe their start to him.

John Hall Britton

John Hall Britton, 74 years old, well known in the rubber industry, died recently at Trenton, N. J. For many years he was paymaster for the Crescent Insulated Wire and Cable Company, of Trenton. Mr. Britton was a member of one of Trenton's oldest families and leaves a widow. He was a member of the Sons of the Revolution, Elks, Masons, Moose, Commercial Travelers' Association and the Trenton Chamber of Commerce.

WILLIAM SEWALL, formerly advertising manager for the Hood and Miller tire divisions of The B. F. Goodrich Company, has been named sales promotion manager for the combined affiliated tire sales divisions, it was announced recently by H. E. KELLER, manager of Goodrich associated tire lines. Mr. Sewall is succeeded by M. G. HUNTINGTON, who will direct advertising for the Miller, Hood, Brunswick and Diamond tire divisions with K. E. HOPKINS as assistant advertising manager.

Mr. Huntington formerly handled advertising for Brunswick and Diamond tires and Mr. Hopkins was assistant advertising manager for the Hood and Miller lines. Mr. Sewall was tire division advertising manager for the Hood Rubber Company, Watertown, Mass., before joining the Goodrich organization in 1929.

GEORGE H. CARNAHAN, president of Intercontinental Rubber Company, 1790 Broadway, New York, N. Y., left on September 17th on an extended visit to the Far East, during which he will inspect the rubber estates of Continental Plantation Company, a subsidiary of Intercontinental, which operated approximately 25,000 acres of rubber plantation on the East Coast of Sumatra. He expects to return to New York shortly after the first of the year.

DR. H. L. TRUMBULL, head of the B. F. Goodrich chemical research laboratories, ARTHUR W. CARPENTER, manager of the testing laboratories, DR. D. P. ALLEN and E. B. NEWTON, research chemists of the same company, returned to their offices recently after vacationing in New England in the path of the total solar eclipse. They brought back to Akron many interesting stories and scientific data.

WILLIAM NICOSIA, elevator operator in the general offices of the B. F. Goodrich Company, Akron, Ohio, doesn't pretend to be an expert gardener, but when anyone brings up the subject of tomato, planting and cultivation—well, that's something else again. Nicosia has been displaying to all who cared to look two of his prize tomatoes, one weighing a pound and 11 ounces and the other a pound and four ounces. He says that although there may be larger specimens, he hasn't seen them yet.

ROBERT S. WILSON, vice-president and sales manager of Goodyear Tire and Rubber Company, has been awarded the 20-year gold service pin by his company. Mr. Wilson joined Goodyear in 1912 after having spent two years subsequent to his graduation from Princeton as an instructor at Lawrenceville academy. He has served as advertising manager, manager of the western division, manager of the truck tire division, manager of the service department, adjuster, and—his first job—a minor clerk in the repair department. He is 42 years old and was born in Wooster, Ohio.

HAROLD W. FEUCHTER has been appointed by the Glyco Products Company, Inc., Bush Terminal, Brooklyn, N. Y., as sales representative for the Buffalo district. Mr. Feuchter was formerly research chemist for the National Aniline and Chemical Company, and will give special attention to the newer emulsifying agents, synthetic resins and waxes.

ROSS WHITE, who has been in the Argentine for the last sixteen years, representing Goodyear Tire and Rubber Company, recently addressed the Akron Y. M. C. A. Exchange Club on the subject "Life in the Argentine."

PHILIP B. PRENTICE has returned from a year's trip through South America as auditor for the Goodyear Tire and Rubber Company. He arrived on the *S.S. Southern Cross*, at New York, on September 5 and plans to spend some time in Kent, O., his home, after business conferences with company officials in Akron.

RALPH MINER, of the Goodyear Tire and Rubber Company, spoke before the Mercator Club of the Akron Y. M. C. A., on September 6, on the subject of "Taxation from the Taxpayer's Standpoint."

PAUL W. LITCHFIELD, Goodyear's president ,who returned recently from a business trip to Europe, gave in detail his observations on his journey before the Shrine Club at the Akron Masonic Temple, on September 8. Goodyear employes entertained at the luncheon with a stunt program.

T. F. DOYLE, of Firestone Tire and Rubber Company, and RALPH H. MINER, of Goodyear Tire and Rubber Company, were appointed by Governor George White, of Ohio, as members of the National Conference on Taxation held in Columbus, September 12-16. Mr. Miner is chairman of the Akron Chamber of Commerce committee on Taxation.

WILLIAM H. SAYEN, JR., president of the Mercer Rubber Company, Hamilton Square, N. J., has been on a business trip through the west. HARRY W. ROBERTS, president of the Pierce-Roberts Rubber Company, has been on a cruise to Lake Champlain and Canada. BRUCE BEDFORD, president of Luzerne Rubber Company, has been to Halifax, Nova Scotia, with his family. HORACE B. TOBIN, head of the Woven Steel Hose and Rubber Company, is on a trip to Germany.

EDGAR H. WILSON, former president of the Dural Rubber Company, Flemington, N. J., has been made assistant manager of the Investors Syndicate at Trenton, N. J., and has removed to that place. HOWARD B. SLUSSER, vice-president and treasurer of the Pocono Rubber Cloth Company, Trenton, N. J., spent his vacation in Southern California.

Rubber News Around the World

CANADIAN GOODYEAR OPERATIONS BELOW 1931

Operations of Goodyear Tire and Rubber Company of Canada are understood to be substantially below the 1931 level with gross sales in the seven months ended July 31, 1932, some 30 per cent below the corresponding figure in the previous year. Domestic sales are down some 20 per cent. Reduction in sales has not been entirely offset by reduction in operating costs and miscellaneous income has dropped slightly so that gross income of the company has declined by some 35 per cent and net profit after providing for income tax is some 62 per cent lower. Even with such substantial decreases the company has more than maintained its position in the Canadian rubber industry; retains an excellent liquid position and has continued provision for adequate depreciation reserves.

Sales of the company this year to date have been moderately below those of the corresponding period a year ago. THE RUBBER AGE is informed, however, that, provided no write-offs for inventories have to be made at the end of this fiscal year, profits, after ample depreciation allowance, should be more than sufficient to cover current dividends on the common stock which are at the rate of $5.00 per share per annum.

At the end of the 1931 year Goodyear showed current assets of $10,479,158, against liabilities of $420,280. Of current assets, $4,747,660 represented call loans and government bonds at market. Since the market for government bonds has appreciated substantially during the past two months, current assets should benefit correspondingly. Provided security markets hold up presumably, certain amounts withdrawn from profits last year to cover depreciation in investment values, will be returned to profit and loss account. It is estimated that the investment account has improved, through appreciation, to close to $300,000.

The Canadian company has recently been filling some orders from India after having been out of that market due to the Ghandhi boycott which is breakng down. Other export business continues on a lower level than in previous years but there are some faint signs of improvement which may not fully materialize before early in 1933. Domestic business usually falls off toward the end of the year.

Comparative Tire Exports

The following figures set forth the officially reported number of automobile casings exported from the United States and the United Kingdom to foreign markets during the first half of 1932. The Canadian official statistics given here include motor cycle and automobile casings. French export statistics covering automobile casings and tubes are officially reported by gross weight only; the number of automobile casings shown as exported from France to each market is an estimate of 1 casing for each 9 kilograms based on the officially reported weight. The compilation of this table is rendered possible through the purchase of British and French export statistics from a fund established by the Rubber Manufacturers Association, Inc.

Tire Exports

Exported from	*No. of Casings*
United States	604,241
Canada	210,296
United Kingdom	650,076
France	383,784

Rubber Areas Abandoned

Official figures from Batavia, Java, to the Rubber Exchange of New York, Inc., disclose that tapping of rubber trees on 450 rubber estates in the Dutch East Indies has been completely abandoned, while tapping on an additional 111 estates has been partially abandoned. On July 31, of this year, 31 per cent of last year's total tappable area was out of production, advices add.

Heel Factory in Colombia

A factory for the manufacture of rubber heels and rubber soled canvas footwear has been establsihed in Medellin, Colombia, South America, by a Colombian company. Most of the machinery was brought from the United States, but some French equipment also has been installed.

The new factory will at first concentrate on the production of rubber heels and it is hoped that the output will amount to about 1,500 dozen pairs per month. Tennis shoes and sneakers also will be manufactured.

Tires for Farm Wagons

A new departure in farm equipment has been inaugurated recently by the Dunlop Rubber Company in England by placing pneumatic tires on the wooden wheels of farm wagons. The tires are especially made to resist farmyard acids.

Experiments were recently tried out before newspaper men and others at a farm near Fort Dunlop, Birmingham, England. First a horse was harnessed to an old-fashioned cart containing 1000 pounds of potatoes in sacks. Horse and cart were then put to a ploughed incline, the top of which was only reached after the horse had been allowed to zig-zag. The effort was an obvious struggle.

Then the horse—the same horse and obviously tired—was harnessed to another cart equipped with pneumatic tires, and bearing the same load. Horse and cart surmounted the ploughed rise with the greatest ease. Subsequently the load was increased to 3,000 pounds, and even then horse nad cart made the ascent without difficulty.

The Dunlop company contends that farm carts equipped with pneumatic tires not only enable heavier loads to be carried and thus save horse power equal to at least 50 per cent, but that greater speed can be achieved.

NEWFOUNDLAND TIRE MARKET RESTRICTED

The use of motor vehicles in Newfoundland is restricted to the months of May to December, inclusive, except in the city of St. John's, where the introduction of street cleaning machinery has made it possible to keep the principal streets open to motor traffic during practically the entire year. Many of the motor-vehicle owners in St. John's, however, do not consider it worth while to operate their cars during the winter months and they are stored until about the first of May.

For statistical purposes, the Newfoundland customs returns list automobiles and tires under one heading; therefore, no information is available as to the value of the tires imported during the fiscal year. In the fiscal year ended June 30, 1931, the total value of automobiles and tires imported into Newfoundland amounted to $394,201 (Canadian currency), as compared with $425,074 for the previous fiscal year.

There are no automobiles or automobile tires manufactured in Newfoundland. All motor vehicles imported are equipped with four tires. It is not customary to furnish extra tires as a part of the original equipment. It is estimated that a motor vehicle after one year's use in Newfoundland requires replacement of two casings and two inner tubes. With the exception of about 2 miles of paved street in tS. John's, there is no pavement laid down in this Dominion. The highways are surfaced with crushed stone and first-quality rear-wheel balloon tires seldom average over 10,000 miles.

American tire manufacturers have little compettiion on this market. With the exception of the Dunlop tire (Canadian), practically all tires sold in Newfoundland are of American make. It is stated that fully 90 per cent of the tires sold on this market are divided among four makes.

Canadian Tire Prices Not Up

The advance in prices of tires in United States market will not be followed by Canadian manufacturers, immediately at least. While prices of rubber have advanced sharply, the marking up of tire prices in the United States is not due to this, but rather to the imposition of an excise tax on tires in that country based on weight, which amounts to 10 to 11%. The advance in rubber was merely the occasion for the increase in tires that has just been put into effect. Since no such tax has been imposed in Canada, evidently manufacturers do not feel disposed to increase prices at this time.

British Rubber Wages

The average wage in the British rubber footwear factory is reported by the *India Rubber Journal* to be approximately 55s. ($9.63) for men and 3 7s. 6d. ($6.57) for women, per week.

Heads Industrial Survey

Fred M. Harpham, vice-president of the Goodyear Tire and Rubber Company, has been designated as chairman of the fourth area group in the Cleveland federal reserve district of the industrial rehabilitation committee being organized by Randolph Eide of Cleveland.

Mr. Harpham is to name two or more vice-chairmen, select his full committee and begin a survey at once to determine what industrial activities in the way of expansion, improvement, repair and so forth can be stimulated.

The move is part of President Hoover's suggestion growing out of the economic conference in Washington, Aug. 26, and contemplates a nation-wide effort to uncover operations that can be immediately launched by industry and which will furnish employment to thousands of men.

The Akron area over which Mr. Harpham will preside embraces, Summit, Stark, Postage, Tuscarawas, Harrison and Medina counties.

Chairman Harpham announced that he would immediately begin his survey and said that he was hopeful that his committee could stimulate a number of enterprises in the way of industrial rehabilitation.

Scrap Dealers Meet

The National Association of Waste Material Dealers, Inc., together with its subsidiary or divisional associations, opened its fall and winter activities on September 22nd with an informal gathering at Association Headquarters, Times Building, New York, for its New York members and out-of-town members who found it possible to attend. A buffet luncheon was served. President Birkenstein of the Association was present and a board of directors meeting was held at 2:30 on the same day.

A similar informal gathering is being planned by Philadelphia members and with business conditions in the waste material industry improving, such gatherings are likely to be held in the larger cities throughout the country.

Goodrich Board Meets

The regular monthly meeting of the board of directors of B. F. Goodrich Company, convened at Akron, on September 13 and was attended by eight members, including D. M. Goodrich, president of the board, and J. D. Tew, president of the company. This was the second time this year that the directorate assembled at Akron.

Only routine matters were handled, according to reports. Other members of the board attending included A. A. Marks, C. E. Sullivan, S. J. Weinberg, W. D. Ticknor, R. S. Rauch and T. B. Tomkinson, the company's comptroller.

Dayton Sales Advance 25%

August dollar sales of Dayton Rubber Manufacturing Company were 25 per cent above July and approximately the same as August, 1931, John A. MacMillan, president, reported. Unit sales in August were 20 per cent higher than the August, 1931.

Kleinert Resumes Work

Kleinert Rubber Company, Long Island City, N. Y., announces that 800 former employes were called back to work recently and have resumed work on a full 5-day-week schedule, which is designed to meet the substantial increase in the unit volume of orders received by the company.

Kelly-Springfield Plan

Directors of Kelly-Springfield Tire Company have called a special stockholders' meeting for Oct. 4 to take final action on the capital readjustment plan. The proposal was declared operative July 28, but more stock has since been deposited.

David Jones Marshall

David Jones Marshall, president of Speck-Marshall Company, 207 Market Street, Pittsburgh, Pa., manufacturers of mill and factory supplies, died at his home in Pittsburgh, on August 28

George M. Spaulding

George M. Spaulding, resident of Akron, O., and one of the few survivors of the "old guard" of employes of the Goodyear company, died September 2 at his home, 892 N. Howard Street, Akron.

He was superintendent of the solid tire department and had been with the Goodyear for 33 years. He was also past master of Akron lodge No. 680, F. & A. M. He was 51 years of age.

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, SEPTEMBER 19, 1932

Crude Rubber

CRUDE rubber lost all it had gained during the last fortnight, but in the case of rubber it was obvious to all observers that the top-heavy statistical position of the commodity could not bear a sustained advance without some stimulation from the manufacturing end of the industry and when the extremely low August consumption figures became known it was a logical market reaction for prices to recede. Consumption in August was particularly disappointing but there is evidence that things are picking up within the industry, particularly in the smaller plants and that the consumption figure for September will touch 30,000 tons. It would appear that the statistical position abroad is improving, British stocks are steadily declining and much of the visible supply of rubber must be understood to be in hands which will not put it back on the market.

Prices as of September 19, as reported on the New York outside market were as follows:

Plantations—			
Ribbed Smoked Sheets—			
Spot-Sept.	—	@	.03½
Oct.-Dec.	—	@	.03½
Jan.-Mar.	—	@	.03⅝
First Latex, crepe spot	.04	@	.04⅛
Amber Crepe, No. 2	—	@	.03 5/16
Amber Crepe, No. 3	—	@	.03¼
Amber Crepe, No. 4	—	@	.03⅛
Brown Crepe, Clean thin	—	@	.03¼
Brown Crepe, rolled	—	@	.03
Latex—			
Liquid Latex, per gal.	.70	@	.75
Paras—			
Up-river, fine	.06½	@	.07
Up-river, coarse	Nominal		
Acre, Bolivian, fine	—	@	.07½
Caucho Ball, Upper	—	@	.03
Centrals—			
Central scrap	.04	@	—
Esmeraldas	.04	@	—
Balata—			
Block, Ciudad	—	@	.18

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers			
Sept.	—	@	2 7/16d
Oct. Dec.	—	@	2 15/32d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers			
Spot	——	@	2⅛d

Reclaimed Rubber

There has been no change in price levels in the standard grades of reclaimed rubber. Prices are already down to an irreducible minimum. It is reported, however, that sales have held up at these prices through August and a satisfactory demand is evident by a slight increase in production activities. Latest quotations remain unchanged as follows:

High Tensile				
High Tensile Red	lb.	.04¾	@	.05
Super-Reclaim Black	lb.	.05	@	.05¼
Shoe				
Washed	lb.	.05½	@	.05¾
Tube				
No. 1 (Floating)	lb.	—	@	.06½
No. 2 (Compounded)	lb.	.04½	@	.04¾
Tires				
Black	lb.	.03¾	@	.04
Black, selected tires	lb.	.04	@	.04¼
Dark Gray		.05	@	.05¼
Light Gray	lb.	.05½	@	.06
White	lb.	.05½	@	.05¾
Truck, Heavy Gravity	lb.	.05	@	.05¼
Truck, Light Gravity	lb.	.05¼	@	.05½
Miscellaneous				
Mechanical blends	lb.	.03	@	.03½

Scrap Rubber

Scrap demand has been disappointing during the recent rise in rubber prices. Unlike the waste material markets in other scrap commodities, scrap rubber did not respond to any advance because of the continued low production in reclaimed. Dealers report that their sales volume has shown no change and that accumulations are still difficult. Prices remain unchanged as follows:

(Prices to Consumer)

Auto tire peelings	ton	12.50	@	14.00
Mixed auto	ton	6.50	@	7.50
Clean solid truck tires	ton	20.00	@	22.00
Boots and shoes	ton	15.00	@	17.50
Arctics, untrimmed	ton	10.00	@	12.50
Inner tubes, No. 1	lb.	.02¼	@	.02½
Inner tubes, No. 2, compounded	lb.	.01	@	.01⅛
Inner Tubes, Red	lb.	.01½	@	.01¾
Air Brake Hose	ton	8.00	@	8.50
Rubber Hose	ton	6.00	@	8.00

Cotton

THE gains made in raw cotton prices two weeks ago have been largely lost through the heavier crop estimates now appearing and large hedging operations which take the edge off of the otherwise active demand. The mill industry showed a distinct gain during August and the textile field, all along the line, is reported to be in better shape than for months past. Prices are still at lows which should be extremely attractive to those manufacturers now in the market for requirements.

High, low and closing prices on the New York Cotton Exchange, as of September 19, were as follows:

	Sept. 19			Sept. 6
	High	Low	Close	Close
Sept.	——	——	6.75	8.78
Oct.	7.00	6.65	6.75	8.86
Dec.	7.15	6.78	6.90	9.03

Tire Fabrics

Prices in the more popular tire fabric constructions advanced during the fortnight in line with the previous rise in the raw cotton market and on the strength of new buying interests. Demand has been somewhat stimulated by increased activity on the part of a number of the smaller tire plants. Late prices follow:

(Prices Net at the Mill)

CORD				
Peeler, carded, 28/4/3	lb.	.23	@	.23¼
Peeler, carded, 28/5/3	lb.	.22	@	.22¼
Peeler, carded, 13/3/3	lb.	.19	@	.19¼
Peeler, carded. 15/3/3	lb.	.20	@	.20¼
Egyptian. carded, 23/5/3	lb.	.36	@	.36¼
Egyptian, combed, 28/5/3	lb.	.41	@	.41¼
CHAFERS				
Carded, American, 8 oz.	lb.	.18	@	.19
Carded, American, 10 oz.	lb.	.18	@	.19
Carded, American, 12 oz.	lb.	.18	@	.19
Carded, American, 14 oz.	lb.	.17½	@	.18
LENO BREAKER				
Carded, American, 8¼ oz.	lb.	.18	@	.21
Carded, American, 10¼ oz.	lb.	.18	@	.21
SQUARE WOVEN				
Carded, American, 17¼ oz. 23-11 ply	lb.	.21½	@	.22
Carded, American, 17¼ oz. 10 ply	lb.	.17	@	.17½

Sheetings

Activity in the sheeting market fell off sharply during the past two weeks and prices declined, in contrast to the situation in tire fabrics and in the face of raw cotton advances. Late quotations follow:

40 inch, 2.50 yard	yd.	—	@	.06½
40 inch, 2.85 yard	yd.	—	@	.05¾
40 inch, 3.15 yard	yd.	—	@	.05⅞
40 inch, 3.60 yard	yd.	—	@	.05½
40 inch, 3.75 yard	yd.	.04⅝	@	.04¾
40 inch, 4.25 yard	yd.	—	@	.04¼

Ducks

Prices on duck constructions advanced on the strength of renewed demands and cotton mill activities. Late prices follow:

Enameling	lb.	.20	@	.22
Belting and Hose	lb.	.22	@	.23
Single filling	lb.	.08¾	@	.09
Double filling	lb.	—	@	.10½

Closing Prices on Rubber Exchange of New York, Inc.

No 1 Standard Contract of 10 Tons*

FROM SEPTEMBER 7 TO 19, 1932

Date	Spot	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sales
Sept. 7	4.37	4.30	4.37	4.44	4.50	4.59	4.67	4.75	4.81	——	248
8	4.23	4.12	4.16	4.20	4.25	4.40	4.45	4.50	4.55	——	153
9	4.06	3.92	4.00	4.06	4.12	4.20	4.27	4.34	4.38	——	167
10	3.95	3.85	3.90	3.96	4.02	4.10	4.18	4.26	4.30	——	73
12	3.75	3.70	3.76	3.80	3.85	3.96	4.00	4.05	4.09	——	206
13	3.75	3.65	3.70	3.75	3.81	3.88	3.95	4.02	4.06	——	258
14	3.69	3.51	3.57	3.62	3.67	3.74	3.80	3.86	3.90	——	199
15	3.76	3.55	3.60	3.65	3.71	3.78	3.85	3.93	3.97	——	68
16	3.60	3.49	3.54	3.59	3.65	3.71	3.77	3.84	3.87	——	77
17	3.45	3.36	3.42	3.47	3.52	3.59	3.65	3.71	3.75	——	39
19	3.36	3.26	3.32	3.37	3.42	3.48	3.54	3.60	3.65	——	110

*This contract will be superseded by "No. 1 B Standard" on April 1, 1933.

CHEMICALS

THERE is an optimistic note in the rubber chemical market, although price levels still remain at previously quoted low figures. There is a distinct sentiment that the upturn has arrived and chemical suppliers have been somewhat encouraged by the new orders coming in during the last fortnight. No particular changes in any specific items have been reported. Late quotations remain unchanged as follows:

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.90 @	.95
Aldehyde amonia, crystals	lb.	.65 @	.67
Altax	lb.		
Captax	lb		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.43
Diphenylguanidine	lb.	.30 @	.32½
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.59½
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	--
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R & H 397	lb.	.75 @	.76
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermic F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.20 @	.22
TMTT	lb.	3.00 @	3.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08¼@	.08¾
Litharge, domestic	lb.	.05¾@	—
Magnesia, calcined,			
light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.12
Browns			
Sienna, Italian	lb.	.05½@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb.	.34½@	.35½
Reds			
Antimony			
crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden, 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Whites			
Lithopone, Albalith	lb.	.04½@	.04¾
Lithopone, Azolith	lb.	.04½@	.04¾
Titanium oxide	lb.	.21 @	—
Titanox B	lb.	.06½@	.07
Titanox C	lb.	.06½@	.07
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.05¾@	.06
ZZ (leaded)	lb.	.05½@	.05¾
Horsehead Lead Free Brand:			
Selected	lb.	.05¾@	.06
Special	lb.	.05¾@	.06
XX Red	lb.	.05¾@	.06
XX	lb.	.05¾@	.06
XX Green	lb.	.05¾@	.06
Leaded Brand, Standard	lb.	.05½@	.05¾
Sterling	lb.	.05½@	.05¾
Superior	lb.	.05½@	.05¾
Lehigh	lb.	.05¼@	.05½
U. S. P., bbls.	lb.	— @	.12¾
Kadox, black label	lb.	.09⅝@	.09⅞
Blue label	lb.	.08⅝@	.08⅞
Red label	lb.	.07¼@	.07½
Cryptone, No. 19	lb.	.06½@	.06¾
Cryptone CB, No. 21	lb.	.06½@	.06¾
XX Zinc Sulphide, bbls.	lb.	— @	.13
St. Joe, black label	lb.	.05¾@	.06
green label	lb.	.05¾@	.06
red label	lb.	.05¾@	.06
Zinc Oxide—French Process			
Anaconda, lead free	lb.	.05¾@	.06
Anaconda, selected lead free	lb.	.06¼@	.06½
Florence White seal, bbls.	lb.	— @	.10¼
Green seal	lb.	.09⅝@	.09⅞
Red seal	lb.	.08⅝@	.08⅞
Yellows			
Chrome	lb.	.16¼@	.17
Ocher, domestic	lb.	.01⅝@	.02

BLACKS

Arrow "Aerfloted"			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
Arrow "Aerfloted" Specification, c.l. f.o.b. wks., bags	lb.	.03 @	—
Bone, powdered	lb.	.05½@	.12½
Carbon, compressed	lb.	.02¾@	.07
uncompressed	lb.	.02¾@	.07
"Certified," Cabot			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Disperso" f.o.b. La.	lb.	.028 @	.071
f.o.b. Texas	lb.	.02¾@	.07
Drop, bbls.	lb.	.05½@	.14
"Excello," compressed	lb.	.03 @	—
"Fumonex"	lb.	.02½@	.06
"Gastex"	lb.	.02½@	.06
Lampblack	lb.	.07 @	.10
"Micronex"			
c.l. f.o.b. works, bags	lb.	.03 @	—
c.l. f.o.b. works, cases	lb.	.04½@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Supreme"	lb.	.02¾@	—
Thermatomic—"P 33"	lb.	—	—
"Thermax"	lb.	—	—
United. "Dixie" and "Kosmos"			
c.l. f.o.b. works, bags	lb.	.02¾@	—
c.l. f.o.b. works, cases	lb.	.04¼@	—
less c.l. f.o.b. works	lb.	.05¼@	.07
"Velvetex"	lb.	.02 @	.05

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½@	.12
Asbestine	ton	13.40 @	14.00
Barium carbonate	ton	56.50 @	57.00
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	33.00 @	—
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	60.00 @	70.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	6.50 @	8.00
Congaree	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	19.00 @	22.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.20 @	.25
medium white	lb.	.16 @	.20
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesia, carbonate	lb.	.08¾@	.11
Mica	lb.	.04½@	—
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	— @	2.57
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	.85 @	1.00
English cliffstone	cwt.	1.50 @	1.70
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.18½@	.22

MINERAL RUBBER

Genasco (factory	ton	40.00 @	42.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Parmr, solid	ton	28.00 @	48.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.05 @	29.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66 degrees	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	— @	.26½
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08 @	.12
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	2.90 @	—
Soda ash, 58% C.L.	cwt.	1.17½@	—
Oils			
Corn, refined, bbls.	lb.	.07 @	.08¾
Cottonseed, crude		— @	.04½
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06½
Palm Lagos	lb.	.04 @	.05
Niger	lb.	.03½@	.04
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.18 @	.23
Pine, steam distilled	gal.	.54 @	.61
destructively distilled	gal.	.54 @	.55
Witco Palm Oil	lb.	.07½@	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb.	bbl.	— @	4.60
Pigmentar	gal.	.18 @	.23
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	— @	.10
Alcohol, denatured,			
No. 1 bbls.	gal.	.28 @	.29
Benzol, 90%	gal.	.20 @	.21
Carbon, bisulfide	lb.	.05½@	.06¼
Carbon, tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.28
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	— @	.37¼
wood	gal.	— @	.40
destructively distilled	gal.	.35 @	—
Waxes			
Beeswax, white	lb.	.34 @	.36
Carnauba	lb.	.26 @	.28
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02½@	—
Refned, 125/127	lb.	.03⅝@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

AgeRite, Gel	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

SPECIALTIES

Aromatics- Rodo	lb.		
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.07 @	.09
White	lb.	.08 @	.14
Brown	lb.	.07 @	.11

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour,			
Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags	cwt.	1.75 @	2.10
Telloy	lb.		
Vandex	lb.		